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1 Introduction

Congratulations on your recent LEGRAND purchase!

ATTENTION
It is necessary to read the whole manual carefully before doing any operation.
Keor SP must be used only in residential and commercial environments.

1.1 Use of the manual

The manual reflects the state of the art when the equipment was put onto the market. This publication conforms to the standards current on that date; the manual cannot be considered inadequate when new standards come into force or modifications are made to the equipment.
The version of the manual updated to its latest release is available on the Internet from the website http://www.ups.legrand.com

1.2 Guarantee terms

The terms of the guarantee may vary depending on the country where the UPS is sold. Check the validity and duration with LEGRAND's local sale representative.

The Manufacturer declines all indirect or direct responsibility arising from:
- failure to observe the installation instructions and use of the equipment which differs from the specifications in the manual;
- use by personnel who have not read and thoroughly understood the content of the manual;
- use that does not comply with the specific standards used in the country where the equipment is installed;
- modifications made to the equipment, software, functioning logic unless they have been authorized by the Manufacturer in writing;
- repairs that have not been authorized by the LEGRAND Technical Support Service;
- damage caused intentionally, through negligence, by acts of God, natural phenomena, fire or liquid infiltration.

1.3 Copyright

2 Safety and Operating Instructions

This section contains important safety and operating instructions that should always be followed during the installation, use and maintenance of the UPS.

- This product should be installed in compliance with installation rules, preferably by a qualified electrician. Incorrect installation and use can lead to risk of electric shock or fire. Before carrying out the installation, read the instructions and take account of the product's specific mounting location. Do not open up, dismantle, alter or modify the device except where specifically required to do so by the instructions. All Legrand products must be opened and repaired exclusively by personnel trained and approved by Legrand. Any unauthorised opening or repair completely cancels all liabilities and the rights to replacement and guarantees. Use only Legrand brand accessories.
- Ensure that the mains supply voltage and frequency match those of the UPS (see the product label and the technical specifications on chapter 7).
- If any visible damage is found on the product during the unpacking operation, do not install the UPS but repack the unit and return it to your reseller or distributor.
- Before operating the UPS or connecting any load equipment, ensure the UPS is connected to a properly grounded mains socket.
- The load applied must not exceed the one indicated on the type label of the UPS.
- The ON/OFF button of the UPS does not electrically isolate the internal parts. To isolate the UPS, unplug it from the mains power socket.
- Do not attempt to open or disassemble the UPS; there are no user replaceable parts. Opening the case will void the warranty and introduces the risk of electric shock even when the mains plug is disconnected.
- Since the non-detachable power supply cable acts as a separation device, the mains power supply socket shall be installed near the UPS and shall be easily accessible.
- In case of a mains power supply failure, do not unplug the power supply cable. Earth continuity must be ensured to the connected loads.
- Do not plug non-computer-related items such as medical, life-support and house electric equipments to the UPS output.
- Do not plug laser printers to the UPS back-up outputs because of their high start-up current.
- The UPS has its own internal energy source (batteries). If the UPS is switched on when no AC power is available, there is hazardous voltage at the output sockets.

The batteries inside the UPS are not user-replaceable. Servicing of batteries must be performed only by electrical hazard authorized personnel.

CAUTION: A battery can present a risk of electrical shock and burns by high short-circuit circuit current. Failed batteries can reach temperatures that exceed the burn thresholds for touchable surfaces. The following precautions should be observed when working on batteries:

a) Remove watches, rings or other metal objects.

b) Use tools with insulated handles.

c) Wear rubber gloves and boots.

d) Do not lay tools or metal parts on top of batteries.

e) Disconnect the charging source prior to connecting or disconnecting battery terminals.

f) Determine if battery is inadvertently grounded. If inadvertently grounded, remove source from ground. Contact with any part of a grounded battery can result in electric shock and burns by high short-circuit current.

The likelihood of such shock can be reduced if such grounds are removed during installation and maintenance (applicable to equipment and remote battery supplies not having a grounded supply circuit).

g) When replacing batteries, replace with the same type and number of batteries or battery packs.

CAUTION: Do not dispose of batteries in a fire. The batteries may explode.

CAUTION: Do not open or mutilate batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic.

CAUTION: Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.

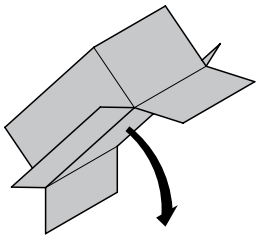
- The UPS has dangerous high voltages on its input and output connections. Contact with these voltages may be life threatening.
- In case of emergency, immediately turn off the equipment and disconnect the power cord from the AC power supply to disable the UPS.
- Do not allow any liquid or any foreign object to enter the UPS.
- The UPS is intended for indoor installation in a ventilated, controlled indoor environment with a range of temperature between 0°C (+32°F) and +40°C (+104°F) and non-condensing humidity <95%.
- Do not install the UPS in locations with sparks, smoke and hazardous gas or where there is water and excessive humidity. Dusty, corrosive, and salty environments can damage the UPS.
- Do not plug the UPS input into its own output.
- Do not attach a power strip or surge suppressor to the UPS.
- Ensure that the cables connecting the loads to the UPS are not longer than 10 meters.
- Keep a clearance of 20 cm beyond the UPS rear panel. Avoid exposing it to direct sunlight or installing it near heat emitting appliances.
- Unplug the UPS prior to cleaning and do not use liquid or spray detergent.
- Do not place the UPS near equipments that generate strong electromagnetic fields and/or near equipments that are sensible to electromagnetic fields.
- The battery of the UPS should be recharged every 2-3 months if unused. To do so, connect the power cable to a suitable grounded mains socket.

WARNING
The UPS is a category C2 product according to the EN 62040-2. In a residential environment, the equipment may cause radio interference, in which case the user may be required to take additional measures.

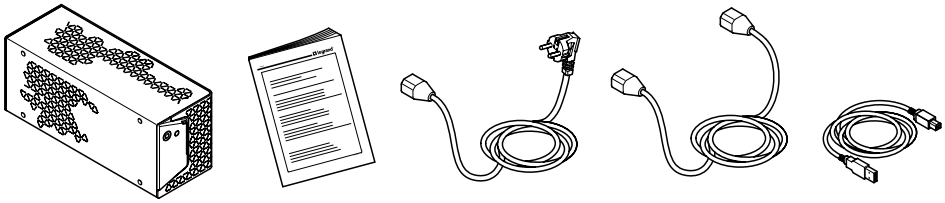
3 Installation

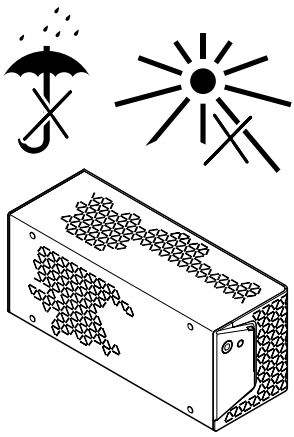
KEOR SP 600 VA - 800 VA

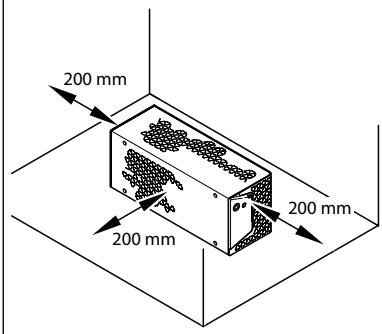
KEOR SP 600	**3 101 80**	**3 101 81**	**3 101 82**
KEOR SP 800	**3 101 83**	**3 101 84**	**3 101 85**



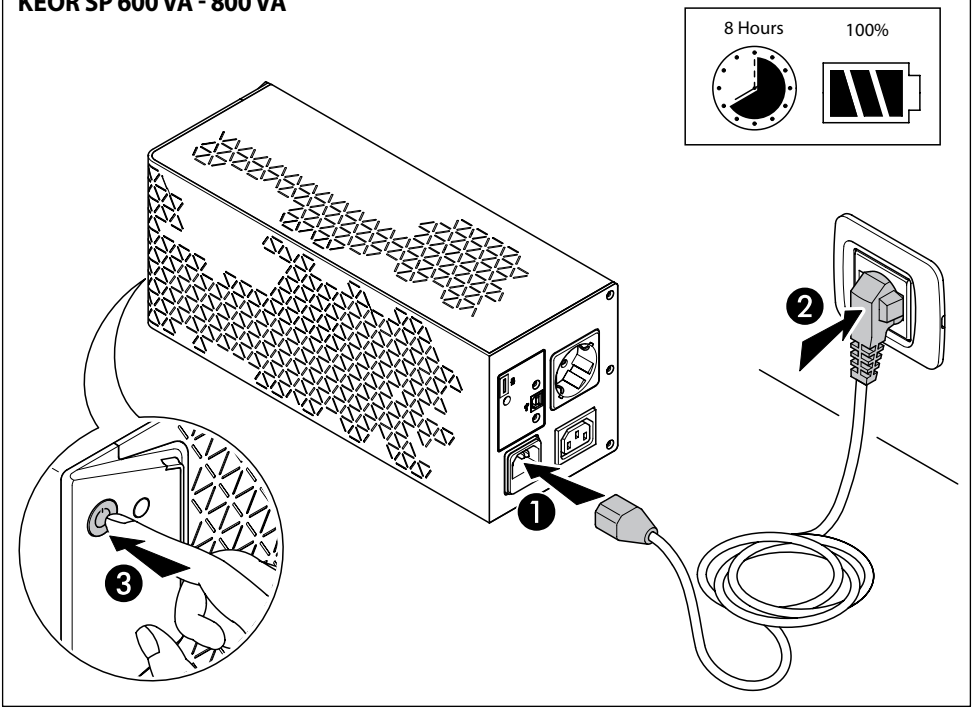
3 101 80/83

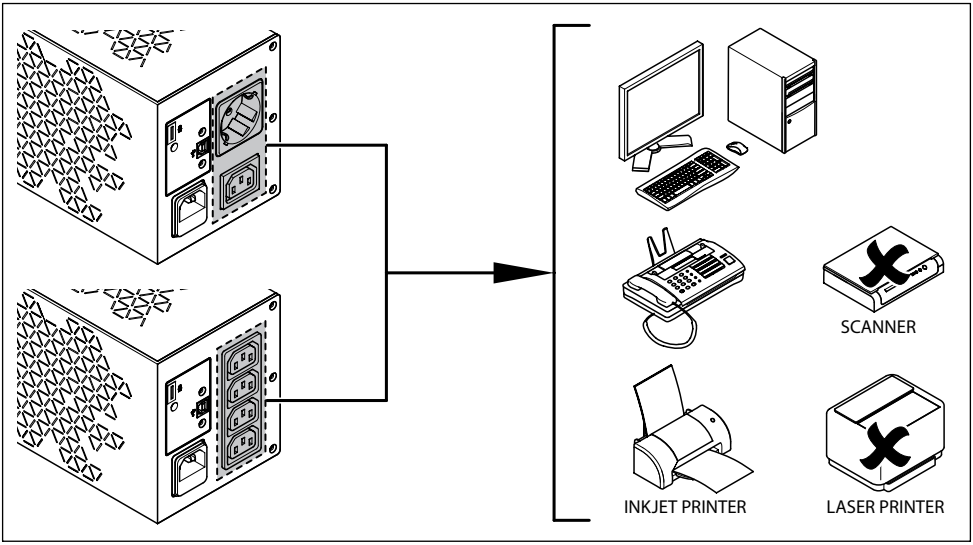






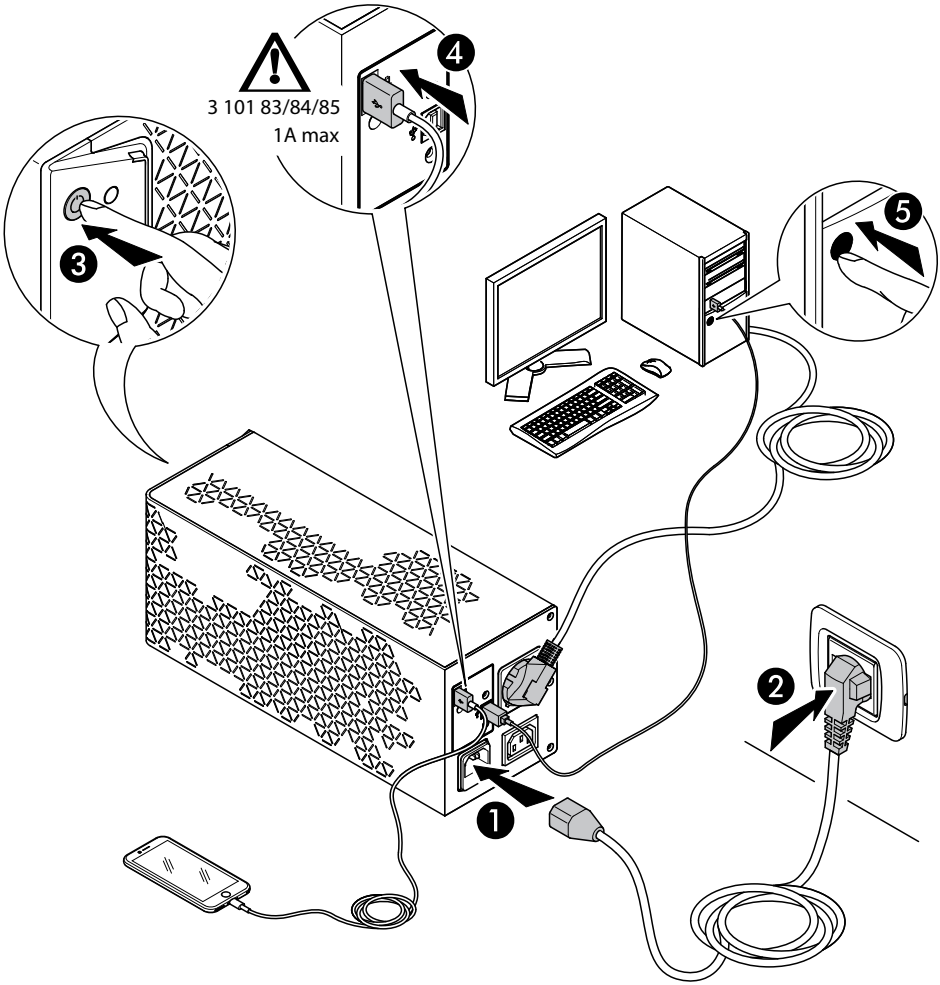
KEOR SP 600 VA - 800 VA





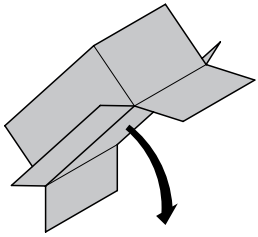
EN

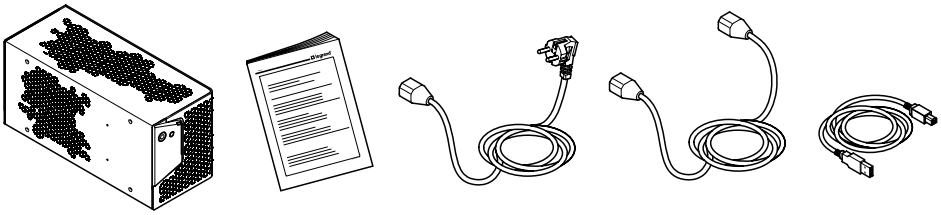
KEOR SP 600 VA - 800 VA

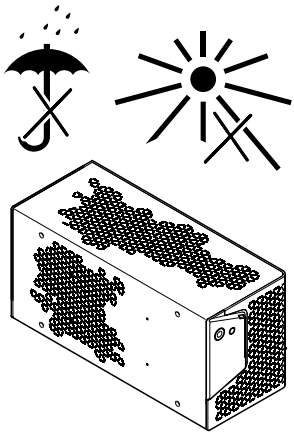


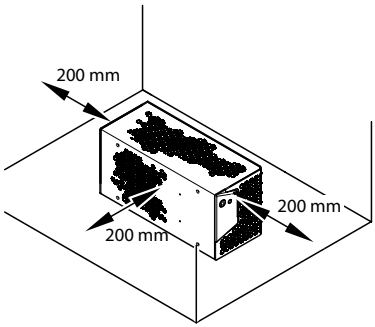
KEOR SP 1 KVA - 1.5 KVA - 2 KVA

KEOR SP 1000	3 101 86	3 101 87	3 101 88
KEOR SP 1500	3 101 89	3 101 90	3 101 91
KEOR SP 2000	3 101 92	3 101 93	3 101 94









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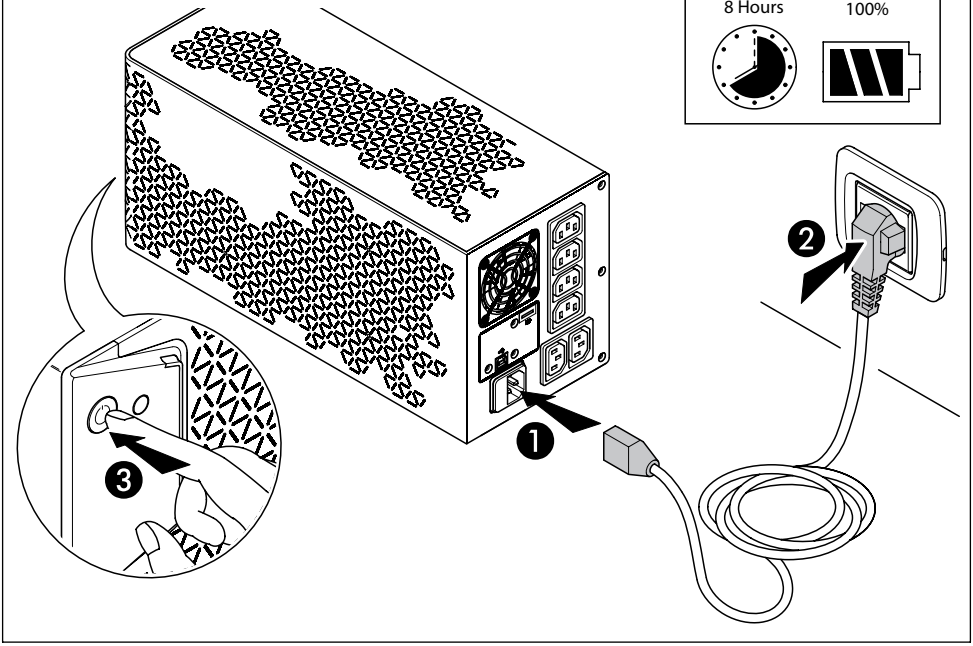
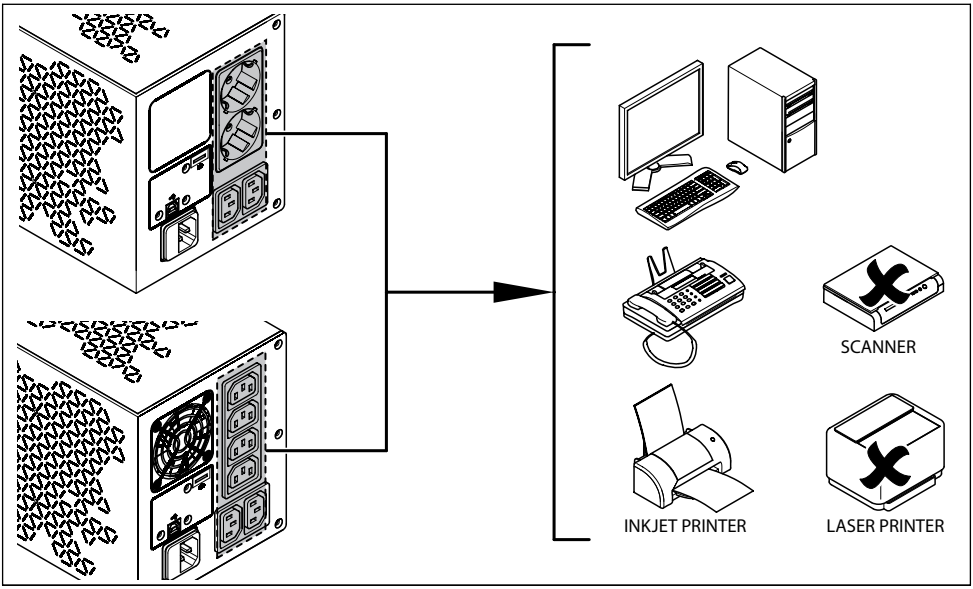
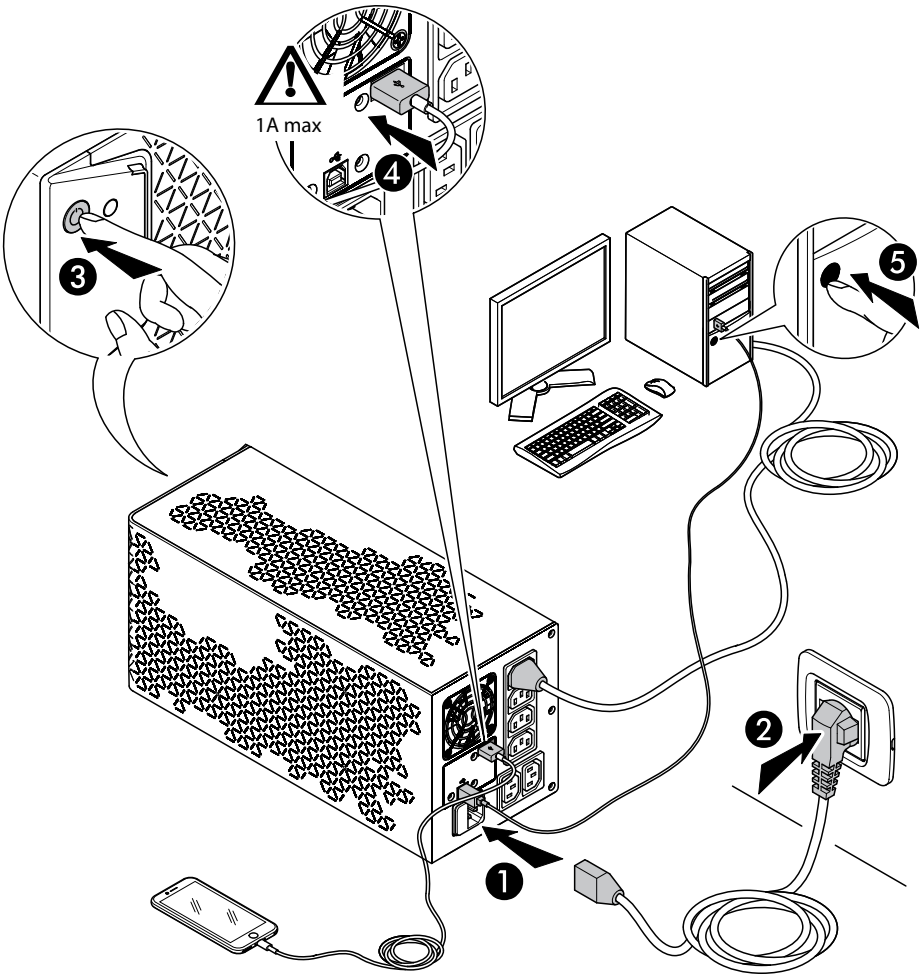


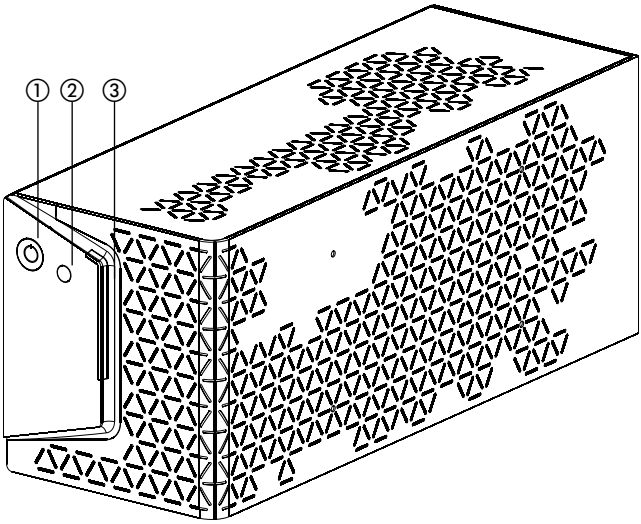


KEOR SP 1 KVA - 1.5 KVA - 2 KVA



4 Operation

4.1 Overview



ITEM	DESCRIPTION
①	ON/OFF button
②	Mute button
③	LED bar

KEOR SP 600/800

KEOR SP 1000/1500/2000

ITEM	DESCRIPTION	ITEM	DESCRIPTION
①	Back-up output sockets	④	USB and RS-232 communication ports
②	Input socket	⑤	USB recharge port (not available on 600 VA model)
③	Replaceable input fuse	⑥	Fan (only on 1500-2000 VA models)

4.2 Start-up procedure

4.2.1 Normal mode

1. Ensure that the mains power supply to be used has a suitable voltage/frequency and an upstream protection rated at either 10A or 16 A (according to the UPS power).
2. Plug the UPS power cord into the mains power supply socket.
3. The UPS recharges the battery each time it is connected to a mains power supply (even if it is powered down). In this stand-by condition, it is also possible to use the USB charger port. It is recommended to charge the battery at least 4 hours before connecting the loads.
4. Connect the loads to the output sockets.
   Ensure that the power of the loads can be managed by the UPS.
5. Press the ON/OFF button to start-up the UPS and power the loads. The led bar is lit in yellow for 3 seconds along with a 3 seconds long acoustic signal. After that, the led bar is lit in green.

INDICATION

The UPS has the autorestart function. In case the mains power fail and the UPS reaches the end of the back-up time, the load is powered automatically when the mains power is back.

4.2.2 Cold start

1. Make sure the internal battery is fully charged.
2. Connect the loads in the sockets.
3. Press the ON/OFF button to start-up the UPS and power the loads. The led bar is lit in yellow for 3 seconds along with a 3 seconds long acoustic signal. After that, the led bar remains lit in yellow and there are two beeps.

INDICATION

The output frequency is set to 50 Hz.

4.3 Mute button

It is possible to mute any alarm signal by pressing the mute button until the double confirmation tone.
If the mute button is pressed again until the double confirmation tone, the alarm signals are re-activated.

4.4 Shutdown

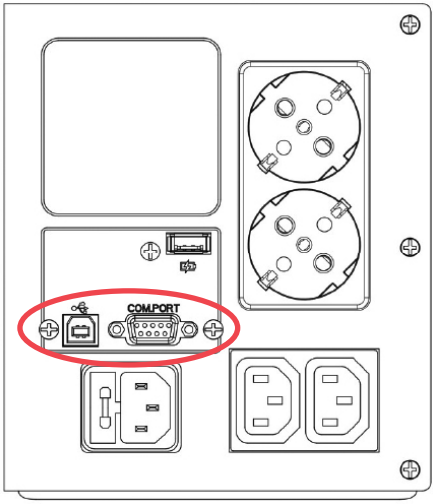
1. Press and hold the ON/OFF button until the led bar turns off.
2. The UPS stops powering the outlets.
3. Unplug the UPS from the mains power supply socket.

4.5 LED bar and Alarm Indicators

LED BAR			ALARM	UPS STATUS
Green	Yellow	Red		
4 LEDs steady	-	-	Off	The UPS is operating in normal mode
-	4 LEDs steady	-	1 beep every 30 seconds	UPS operating in battery mode with battery status 100%-75%
-	3 LEDs steady	-	2 beeps every 30 seconds	UPS operating in battery mode with battery status 75%-50%
-	2 LEDs steady	-	3 beeps every 15 seconds	UPS operating in battery mode with battery status 50%-25%
-	1 LED steady	-	4 beeps every 15 seconds	UPS operating in battery mode with battery status 25%-10%
-	1 LED blinking	-	Intermittent	UPS operating in battery mode with battery status <10%
4 LEDs blinking	-	-	Intermittent	Overload in normal mode
	-	4 LEDs steady	Continuously sounding	UPS shutdown due to prolonged overload
-	4 LEDs rolling	-	Off	Battery service
4 LEDs steady	-	-	1 beep every 3 seconds	Overtemperature
-	-	4 LEDs steady	Continuously sounding	UPS fault (other than overload)

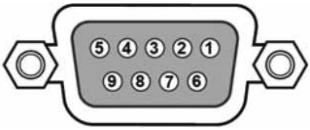
4.6 Communication devices

The UPS has one RS-232 female serial port and one USB 2.0 type-B port.

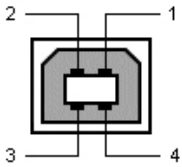


Only one communication interface at a time can control the UPS, according to the following priority:
1) USB;
2) RS-232 (it uses a pin-to-pin DB9 male/female cable).

The following diagrams show the pinout of the RS-232 and USB ports:



Pin 2: RxD
Pin 3: TxD
Pin 5: GND



Pin 1: VCC (+5V)
Pin 2: D-
Pin 3: D+
Pin 4: GND

It is possible to download specific communication software from the website http://www.ups.legrand.com.

5 Troubleshooting

INDICATION	POSSIBLE CAUSE	SOLUTION
Alarm LED ON 	UPS fault	Remove the loads from the UPS outlets. Turn off the UPS and disconnect it from the mains. Connect the UPS to the mains and turn on again. If the problem persists, contact the LEGRAND Technical Support Service.
Intermittent alarm sound with the UPS working in normal mode	Overload	Disconnect some non-critical loads from the UPS outlets until the overload ceases
The UPS doesn't work in stored energy mode or the backup time is shorter than its intended performance	Low battery or battery fault	If the backup time remains unsatisfactory after 8 hours of battery charging, contact the LEGRAND Technical Support Service
The UPS is working normally but the loads are not powered	-	Check that all power cords are properly connected. If the problem persists, contact the LEGRAND Technical Support Service.
The UPS works on battery mode even though the mains power is available	The UPS fuse blew up	Replace the fuse with a new one
	The mains power supply socket is not supplying power to the UPS	Check that the UPS works on another socket. If so, have the initial mains power supply socket checked by a qualified electrician.
Strange noise or smell	UPS fault	Shut down immediately the UPS. Unplug the UPS from the mains socket and contact the LEGRAND Technical Support Service.

6 Warehousing and dismantling

6.1 Warehousing

The UPS must be stored in an environment with a room temperature between +20°C (+68°F) and +25°C (+77°F) and humidity less than 95% (not condensing). The battery installed inside the UPS is lead/acid sealed and does not require maintenance (VRLA). The battery should be charged for 8 hours every 3 months by connecting the UPS to the mains supply socket. Repeat this procedure every two months if the storage ambient temperature is above +25°C (+77°F).

CAUTION

The UPS must never be stored if the battery is partially or totally discharged.
LEGRAND is not liable for any damage or bad functioning caused to the UPS by wrong warehousing.

6.2 Dismantling

DANGER

Dismantling and disposal operations may only be done by a qualified electrician. These instructions are to be considered indicative: in every country there are different regulations with regard to the disposal of electronic or hazardous waste such as batteries. It is necessary to strictly adhere to the standards in force in the country where the equipment is used.
Do not throw any component of the equipment in the ordinary rubbish.

Batteries must be disposed of in a site intended for the recovery of toxic waste. Disposal in the traditional rubbish is not allowed.
Apply to the competent agencies in your countries for the proper procedure.

WARNING

A battery may constitute a risk of an electric shock and high short-circuit current.
When working on batteries, the prescriptions indicated in chapter 2 are to be adhered to.

It is important to dismantle the various parts the UPS consists of. For these operations, Personal Protective Equipment must be worn.
Sub-divide the components separating the metal from the plastic, from the copper and so on according to the type of selective waste disposal in the country where the equipment is dismantled.

If the dismantled components must be stored before being properly disposed, be careful to keep them in a safe place protected from atmospheric agents to avoid soil and groundwater contamination.

For the disposal of electronic waste it is necessary to refer to the industry standards.

This symbol indicates that in order to prevent any negative effects on the environment and on people, this product should be disposed of separately from other household waste, by taking it to authorised collection centres, in accordance with the EU countries local waste disposal legislations. Disposing of the product without following local regulations may be punished by law. It is recommended to check that this equipment subject to WEEE legislations in the country where it is used.

7 Technical specifications

	3 101 80 3 101 81 3 101 82	3 101 83 3 101 84 3 101 85	3 101 86 3 101 87 3 101 88	3 101 89 3 101 90 3 101 91	3 101 92 3 101 93 3 101 94
General characteristics					
Nominal power (VA)	600	800	1000	1500	2000
Active Power (W)	360	480	600	900	1200
Technology	line interactive (VI)				
Waveform	simulated sinewave (during battery mode)				
Transfer time (ms)	2-6 (typical)				
Input characteristics					
Connection	detachable cable 3x0.75mm² with German/French standard plug		detachable cable 3x1mm² with German/French standard plug		
Rated voltage (V)	230				
Range of voltage (V)	170 - 280				
Rated frequency (Hz)	50 / 60 ± 5 with auto-sensing				
Rated current (A)	2.8	3.7	4.6	6.9	9.1
Replaceable fuse	T5AL250V		T10AL250V		T15AL250V
Output characteristics					
Outlets	4 x IEC C14 (3 101 80 / 3 101 83) 1 x CEE 7/3 + 1 x IEC C14 (3 101 81 / 3 101 84) 1 x CEE 7/5 + 4 x IEC C14 (3 101 82 / 3 101 85) USB Type A Female / 5 V - 1 A (only 800 VA models)		6 x IEC C14 (3 101 86 / 3 101 89 / 3 101 92) 2 x CEE 7/3 + 2 x IEC C14 (3 101 87 / 3 101 90 / 3 101 93) 2 x CEE 7/5 + 2 x IEC C14 (3 101 88 / 3 101 91 / 3 101 94) USB Type A Female / 5 V - 1 A (all models)		
Rated voltage (V)	230 V ± 10% (during battery mode)				
Rated frequency (Hz)	50 / 60 ± 1 with auto-sensing (during battery mode)				
Rated current (A)	2.6	3.5	4.4	6.6	8.7
Efficiency	up to 98%				

7 Technical specifications

	3 101 80 3 101 81 3 101 82	3 101 83 3 101 84 3 101 85	3 101 86 3 101 87 3 101 88	3 101 89 3 101 90 3 101 91	3 101 92 3 101 93 3 101 94
Overload capacity	during normal mode: automatic shutdown after 5 minutes with load>100% automatic shutdown after 5 seconds with load>120% immediate shutdown for short-circuit during battery mode: immediate shutdown				
Batteries					
Number of batteries	1		2		
Battery type	6-cell VRLA (valve-regulated lead-acid), maintenance free				
Battery voltage/capacity	12Vdc - 7 Ah	12Vdc - 9 Ah	12Vdc - 7 Ah	12Vdc - 9 Ah	
Backup time	10 min. (calculated with one typical workstation)				
Protection	against total discharge				
Typical recharge time	4-6 hours				
Communication and management					
Interface	two pushbuttons and four LEDs				
USB HID	type B				
Alarms	Visual (LEDs), Audible (buzzer)				
Mechanical characteristics					
Dimensions W x H x D (mm)	20 x 138 x 330		148 x 173 x 380		
Net weight (kg)	4.8	5.5	8.3	9.6	10.3
Environmental conditions					
Operating temperature (°C)	0 to +40				
Operating relative humidity	<95% (non-condensing)				
Storage temperature (°C)	+20 to +25				
Noise level at 1 m	< 40 dB				
IP code	IP 20				
Reference directive and standards					
Safety	2014/35/EU Directive EN 62040-1				
EMC	2014/30/EU Directive EN 62040-2 (category C2)				